

**TRANSLATION** PATENT COOPERATION TREATY  
**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>BR3579RM/PJ</b>	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. <b>PCT/FR2004/002450</b>	International filing date (day/month/year) <b>28.09.2004</b>	Priority date (day/month/year) <b>02.10.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>C25C3/14</b>		
Applicant <b>ALUMINIUM PECHINEY</b>		

<ol style="list-style-type: none"> <li>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</li> <li>2. This REPORT consists of a total of <u>8</u> sheets, including this cover sheet.</li> <li>3. This report is also accompanied by ANNEXES, comprising:           <ol style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <u>6</u> sheets, as follows:               <table border="0" style="width: 100%;"> <tr> <td style="width: 15px;"><input checked="" type="checkbox"/></td> <td style="width: 85%;">sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</td> </tr> <tr> <td><input type="checkbox"/></td> <td>sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</td> </tr> </table> </li> <li>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ol> </li> </ol>	<input checked="" type="checkbox"/>	sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).	<input type="checkbox"/>	sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.												
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<ol style="list-style-type: none"> <li>4. This report contains indications relating to the following items:           <table border="0" style="width: 100%;"> <tr> <td style="width: 15px;"><input checked="" type="checkbox"/></td> <td style="width: 85%;">Box No. I Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V Reasoned statement under Article 35(2), with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII Certain observations on the international application</td> </tr> </table> </li> </ol>	<input checked="" type="checkbox"/>	Box No. I Basis of the report	<input type="checkbox"/>	Box No. II Priority	<input type="checkbox"/>	Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V Reasoned statement under Article 35(2), with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI Certain documents cited	<input type="checkbox"/>	Box No. VII Certain defects in the international application	<input type="checkbox"/>	Box No. VIII Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/FR2004/002450

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:

- international search (Rule 12.3 and 23.1(b))
- publication of the international application (Rule 12.4)
- international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished  
 the description:

pages 1-15 as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:

nos. \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19  
29.12.2005 with telefax

nos.\* 1-34 received by this Authority on \_\_\_\_\_

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:

sheets 1/6-6/6 as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-34	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-34	NO
Industrial applicability (IA)	Claims	1-34	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: DE 299 10 803 U (VAW ALUMINIUM TECHNOLOGIE  
GMBH) 16 September 1999;

D2: US-B1-6 436 270 (LARS GÖRAN SANDER)  
20 August 2002.

## 1. INDEPENDENT CLAIMS

The present application does not fulfil the requirements set forth in PCT Article 33(1) because the subject matter of **claims 1 and 26** does not involve an inventive step as defined in PCT Article 33(3).

1.1 Document D1, which is considered to be the prior art closest to the subject matter of **claim 1**, describes (the references between parentheses apply to said document):

- a method for monitoring the addition of powder materials to an electrolysis cell for producing

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aluminium, which cell is provided with a powder-dispensing device and a boring device that has a crust breaker (page 1, lines 1-2).

Said method makes it possible to detect a malfunction in the crust breaking device and is based on the measurement of the time required for crust breaker movement (page 2, lines 14-17).

More specifically, the method includes steps of:

- providing the boring device with a lower-position detector (page 13, lines 1-5);
- detecting the position of said crust breaker and measuring the time required for movement thereof to a predetermined position, the upper position of said crust breaker (page 12, line 26 to page 13, line 6);
- comparing the time measured with a time interval (page 13, lines 17-18);
- determining that said boring device operates properly (or improperly) if the times measured are inside (or outside) said time interval (respectively) (page 13, lines 9-14), and
- performing an appropriate operation in the event of boring device malfunction (page 15, line 21 to page 16, line 6).

It follows that the subject matter of claim 1 differs from the teaching in D1 in that:

- the time is accurately measured between two separate positions, the starting position and the lower position, while said crust breaker is

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being lowered.

The effect of this technical feature is to provide a simple, more accurate diagnostic of the supply operation.

The problem that the present invention is intended to solve can therefore be considered to be that of enhancing the method for monitoring the addition of powder materials to an electrolysis cell for producing aluminium in such a way as to provide a simple, more accurate diagnostic of the supply operation at said crust breaker.

The solution to this problem, as proposed in claim 1 of the present application, is not considered to involve an inventive step (PCT Article 33(3)), for the following reasons:

The detection of a lower position in combination with the measurement of the time required for crust breaker lowering is known from the prior art (cf. D2, column 1, line 62 to column 2, line 5). The subject matter in D2 relates to the detection of improper crust breaker operation when said crust breaker comes into contact with the crust (column 1, lines 20-25 and lines 57-61). The measurement therefore relates to the time required for crust breaker lowering (figure 2) and the aim is to verify that said crust breaker has effectively broken the crust and is in contact with the melt. Figure 2 in document D2 clearly

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shows an accurate measurement of the lowering time and the boring time of said crust breaker. In D2, the lower position is determined by crust breaker contact with the liquid electrolyte (column 3, lines 10-11). It follows that said lower position is determined in the same manner as the one described in the present application (claim 19, the description, page 9, lines 29-30). A person skilled in the art, faced with the problem of enhancing this monitoring method, would find features in D2 that can be combined with the method in D1 in such a way as to arrive at an enhanced monitoring method as per claim 1 without having to exercise any inventive skill.

Similarly, the corresponding monitoring system for implementing the method can be derived from the combination of D1 (page 12, line 19 to page 16, line 6) with D2 (claim 1). Indeed, in D1 as in D2, the subject matter of the disclosed inventions relates to a method for monitoring supply operations to an electrolysis cell for producing aluminium by means of fused salt electrolysis, and to a monitoring system suitable for implementing said method. As a result, **claim 26** does not appear to be inventive (PCT Article 33(3)).

**2. DEPENDENT CLAIMS**

Dependent **claims 2-25 and 27-34** do not contain any features which, in combination with the features of any one of the claims to which they refer,

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fulfil the PCT requirements of novelty and inventive step (PCT Article 33(2) and 33(3)).

### 3. CLARITY

The application does not fulfil the requirements set forth in PCT Article 6 because **claims 1, 19 and 26** are not clear.

The fact that the measurements must not be carried out directly on the cell is clear from page 3 (lines 1-5) of the description. The essential nature of this feature is also apparent from figures 5 and 6 of the present application, i.e. the only detectors illustrated in said figures are associated not with the crust breaker *per se* but with the piston (reference sign 36 in figures 5 and 6).

Since independent claims 1 and 26 do not contain this feature, they do not fulfil the requirements set forth in PCT Article 6 in conjunction with PCT Rule 6.3(b), which stipulate that each independent claim must contain all of the technical features essential for the definition of the invention.

What is more, **claim 19** and the description of the present application (page 9, lines 29-30) clearly show that the predetermined lower position is optionally the surface of the liquid electrolyte bath. Since this surface is subject to variations

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in height during electrolysis, the detection of the lower position must, in this case, be performed in relation to measurements carried out directly on the cell. This is inconsistent with the description, page 3, lines 1-5, and is, consequently, contrary to PCT Article 6.